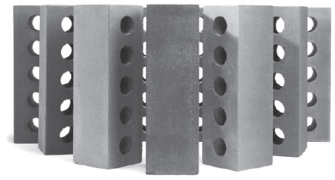
CHAPTER 5

# United States Energy Use

# Closing the Loop
## on Coal Combustion Waste



**CalStar Products.** For decades, burning coal to make electricity has generated huge amounts of waste, mostly in the form of "fly ash", the very fine powder that is captured in filters in power plant stacks. Some fly ash is used productively as a cement replacement in concrete and in other building materials, but most of it ends up in landfills.

A local manufacturer is giving power companies an alternative to disposing of fly ash as trash. Calstar, located in Caledonia just north of Racine, is turning fly ash into something useful: environmentally friendly building bricks and landscape pavers.

Calstar sources fly ash from We Energies, who is a likely partner in two ways – it operates the large, coal-burning South Oak Creek power plant, and is currently the premier recycler of fly ash in the country.

Traditional clay-based bricks are "fired" in a hot kiln, which uses a lot of energy and generates carbon dioxide, a greenhouse gas. In fact, each of the 8 billion or so clay bricks used in the U.S. in a typical year generates almost a pound of carbon dioxide in its manufacture. CalStar's fly ash bricks require no firing in a kiln. This dramatically reduces the amount of energy used, and the amount of carbon dioxide generated – by over 85%!

# Industrial Energy Efficiency


**Xten Industries.** It isn't often that the terms 'plastics processing' and 'environmentally-friendly' are found, or even thought of, in the same sentence. However, one local company is attempting to prove that the two are not quite as mutually exclusive as they may seem. Xten Industries, a plastic molding and manufacturing company in Kenosha, is actively searching for ways to make plastics processing more energy efficient.

Xten has installed a number of energy-saving devices at its facility—everything from energy-efficient lights and motion sensors to power-saving heater bands on nearly half of its molding machines. Four of Xten's presses are equipped with variable frequency drives (VFD) that vary the amount of energy a press uses. Depending on the process cycle demand, sometimes the VFDs limit energy to as little as 20 percent of normal, when demand is very low.

Sometimes the solution to an energy efficiency problem is as simple as fixing a leak. With the help of Wisconsin's Focus on Energy program, Xten was able to audit its air lines and compressors for leaks, fixing any they found. Compressed air is often costly, and an air leak can be a major source of lost energy.

For the moment, Xten's energy-saving efforts are focused on industrial-level efficiency which brings monetary savings. According to Xten's engineering director, Mark Dirr, saving energy and saving money go hand-in-hand. "Sustainability is about making responsible choices that help the environment and ensure that your company will survive the business pressures it faces."

# United States Resource Energy Consumption, by Type of Fuel

**U.S. ENERGY CONSUMPTION 2.2%**

In 2008, total energy consumption in the United States decreased 2.2 percent.

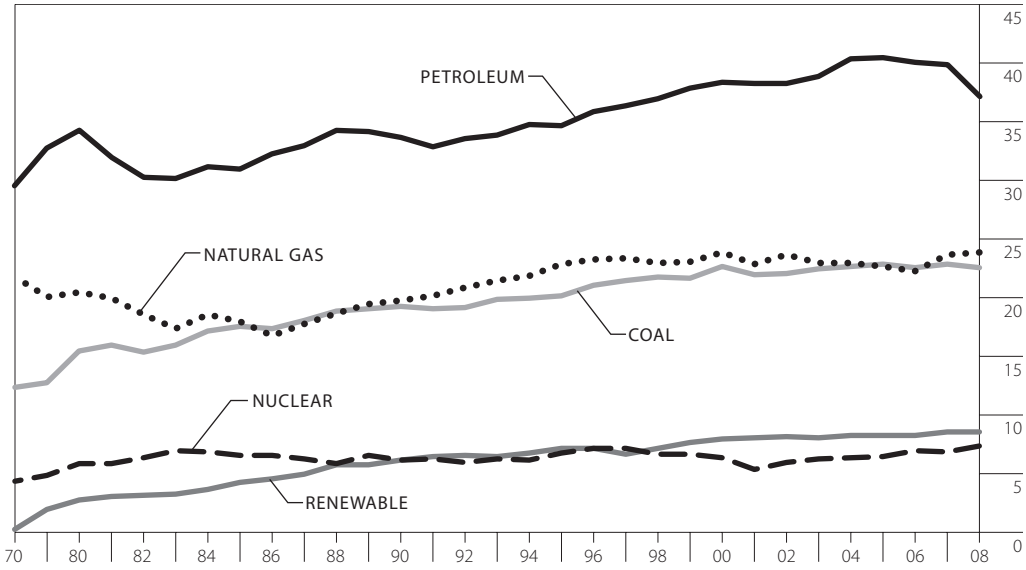
**PETROLEUM 6.6%**
**COAL 1.4%**

There were decreases for petroleum (6.6 percent) and coal (1.4 percent).

**NATURAL GAS 0.9%**
**RENEWABLE 7.1%**

There were increases for natural gas (0.9 percent), and renewable energy (7.1 percent).

## 1970-2008 QUADRILLIONS OF BTU




## 1970-2008 QUADRILLIONS OF BTU AND PERCENT OF TOTAL

| Year | Petroleum | | Natural Gas | | Coal | | Nuclear | | Renewable[a] | | Total[b] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1970 | 29.5 | *43.4%* | 21.7 | *31.9%* | 12.3 | *18.1%* | 0.2 | *0.3%* | 4.3 | *6.3%* | 68.0 |
| 1975 | 32.7 | *45.4%* | 20.0 | *27.7%* | 12.7 | *17.6%* | 1.9 | *2.6%* | 4.8 | *6.7%* | 72.1 |
| 1980 | 34.2 | *43.6%* | 20.4 | *26.0%* | 15.4 | *19.6%* | 2.7 | *3.4%* | 5.8 | *7.4%* | 78.5 |
| 1985 | 30.9 | *40.1%* | 17.9 | *23.2%* | 17.5 | *22.7%* | 4.2 | *5.5%* | 6.5 | *8.4%* | 77.0 |
| 1990 | 33.6 | *39.6%* | 19.7 | *23.3%* | 19.2 | *22.6%* | 6.1 | *7.2%* | 6.1 | *7.2%* | 84.7 |
| 1995 | 34.6 | *37.9%* | 22.8 | *25.0%* | 20.1 | *22.0%* | 7.1 | *7.8%* | 6.7 | *7.3%* | 91.2 |
| 2000 | 38.3 | *38.7%* | 23.8 | *24.1%* | 22.6 | *22.9%* | 7.9 | *8.0%* | 6.3 | *6.3%* | 98.9 |
| 2001 | 38.2 | *39.7%* | 22.8 | *23.7%* | 21.9 | *22.8%* | 8.0 | *8.3%* | 5.3 | *5.5%* | 96.3 |
| 2002 | 38.2 | *39.1%* | 23.6 | *24.1%* | 22.0 | *22.5%* | 8.1 | *8.3%* | 5.9 | *6.0%* | 97.8 |
| 2003 | 38.8 | *39.5%* | 22.9 | *23.3%* | 22.4 | *22.8%* | 8.0 | *8.1%* | 6.2 | *6.3%* | 98.2 |
| 2004 | 40.3 | *40.2%* | 22.9 | *22.9%* | 22.6 | *22.5%* | 8.2 | *8.2%* | 6.3 | *6.2%* | 100.3 |
| 2005 | 40.4 | *40.2%* | 22.6 | *22.5%* | 22.8 | *22.8%* | 8.2 | *8.1%* | 6.4 | *6.4%* | 100.4 |
| 2006[r] | 40.0 | *40.0%* | 22.2 | *22.3%* | 22.5 | *22.6%* | 8.2 | *8.2%* | 6.9 | *6.9%* | 99.8 |
| 2007[r] | 39.8 | *39.2%* | 23.6 | *23.3%* | 22.8 | *22.4%* | 8.5 | *8.3%* | 6.8 | *6.7%* | 101.4 |
| **2008** | **37.1** | ***37.4%*** | **23.8** | ***24.0%*** | **22.5** | ***22.6%*** | **8.5** | ***8.5%*** | **7.3** | ***7.4%*** | **99.2** |

**a** Includes net imports of electricity.

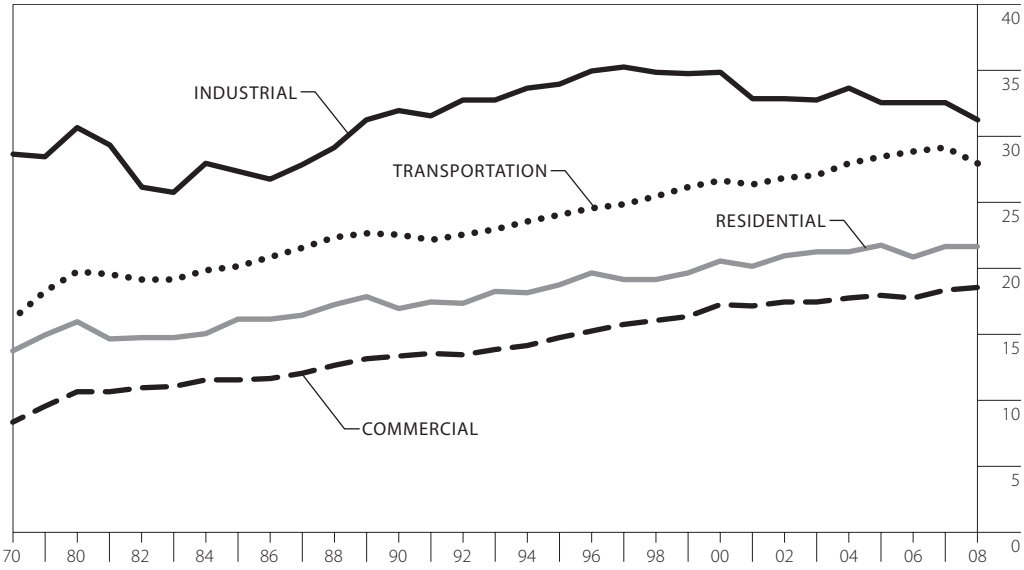
**b** Totals vary slightly from US resource consumption totals elsewhere in this publication because they do not include net imports of electricity.

**r** Revised.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Table 1.3 [DOE/EIA-0035 (2009/05)] (March 2009). http://www.eia.doe.gov/emeu/mer Annual data at: http://www.eia.doe/gov/emeu/aer

# United States Resource Energy Consumption, by Economic Sector

## 1970-2008 QUADRILLIONS OF BTU




## 1970-2008 QUADRILLIONS OF BTU AND PERCENT OF TOTAL

| Year | Residential[a] | | Commercial[a] | | Industrial | | Transportation | | Total[b] |
|---|---|---|---|---|---|---|---|---|---|
| 1970 | 13.7 | *20.5%* | 8.3 | *12.4%* | 28.6 | *42.9%* | 16.1 | *24.1%* | 66.7 |
| 1975 | 14.9 | *21.0%* | 9.5 | *13.4%* | 28.4 | *40.0%* | 18.2 | *25.6%* | 71.0 |
| 1980 | 15.9 | *20.7%* | 10.6 | *13.8%* | 30.6 | *39.8%* | 19.7 | *25.7%* | 76.8 |
| 1985 | 16.1 | *21.5%* | 11.5 | *15.3%* | 27.3 | *36.4%* | 20.1 | *26.8%* | 75.0 |
| 1990 | 16.9 | *20.0%* | 13.3 | *15.7%* | 31.9 | *37.7%* | 22.5 | *26.6%* | 84.6 |
| 1995 | 18.7 | *20.4%* | 14.7 | *16.1%* | 33.9 | *37.2%* | 24.0 | *26.3%* | 91.2 |
| 2000 | 20.5 | *20.6%* | 17.2 | *17.4%* | 34.8 | *35.1%* | 26.6 | *26.9%* | 99.1 |
| 2001 | 20.1 | *20.9%* | 17.1 | *17.8%* | 32.8 | *34.1%* | 26.3 | *27.3%* | 96.3 |
| 2002 | 20.9 | *21.3%* | 17.4 | *17.8%* | 32.8 | *33.5%* | 26.8 | *27.4%* | 97.9 |
| 2003 | 21.2 | *21.6%* | 17.4 | *17.7%* | 32.7 | *33.3%* | 27.0 | *27.5%* | 98.3 |
| 2004 | 21.2 | *21.1%* | 17.7 | *17.6%* | 33.6 | *33.5%* | 27.9 | *27.8%* | 100.4 |
| 2005 | 21.7 | *21.6%* | 17.9 | *17.8%* | 32.5 | *32.3%* | 28.4 | *28.3%* | 100.5 |
| 2006[r] | 20.8 | *20.8%* | 17.7 | *17.7%* | 32.5 | *32.6%* | 28.8 | *28.9%* | 99.8 |
| 2007[r] | 21.6 | *21.3%* | 18.3 | *18.0%* | 32.5 | *32.0%* | 29.1 | *28.7%* | 101.5 |
| **2008** | **21.6** | ***21.8%*** | **18.5** | ***18.6%*** | **31.2** | ***31.5%*** | **27.9** | ***28.1%*** | **99.2** |

**a** Agricultural energy use allocated between residential and commercial sectors.

**b** Numbers may not match with previous pages due to independent rounding.

**r** Revised.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* Table 2.1 [DOE/EIA-0035 (2009/05] (May 2009). http://www.eia.doe.gov/emeu/mer/ Annual data: http://www.eia.doe.gov/emeu/aer/

COMMERCIAL **1.4%**

RESIDENTIAL **0.1%**

During 2008, the biggest increase in energy use was in the commercial sector (1.4 percent) with a slight increase in residential sector (0.1 percent).

INDUSTRIAL **4.1%**

TRANSPORTATION **4.2%**

Energy use in the industrial sector decreased 4.1 percent and 4.2 percent in the transportation sector.

# Sources of U.S. Crude Oil and Petroleum Products

**U.S. PETROLEUM USE 6.1%**

In 2008, U.S. petroleum use decreased 6.1 percent. Since 1985, U.S. consumption of petroleum products has increased almost 23.5 percent. During this same period, U.S. crude oil production has decreased 44.8 percent (lower 48 production fell 40.2 percent). This resulted in a 154 percent increase in imports since 1985, with a corresponding 226 percent increase in imports from the Organization of Petroleum Exporting Countries (OPEC). In 2008, U.S. imports of crude oil and petroleum products decreased 4.4 percent, and imports from OPEC decreased 0.4 percent.

**1975-2008** THOUSANDS OF BARRELS PER DAY

| Year | U.S. Petroleum Use | U.S. Field Production[a] | U.S. Crude Oil Production from Oil Wells | Natural Gas Plant Liquids from U.S. Natural Gas Wells[b] | Crude Oil from Wells in Lower 48 States | U.S. Crude Oil & Product Exports | U.S. Crude Oil & Product Imports (Total)[c] | U.S. Crude Oil and Product Imports from OPEC | Imports as a Percent of U.S. Petroleum Use | OPEC Imports as a Percent of U.S. Imports | Imports as a Percent of U.S. Crude Oil Production & Imports |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975 | 16,322 | 10,007 | 8,375 | 1,633 | 8,183 | 209 | 6,056 | 3,601 | 37.1% | 59.5% | 42.0% |
| 1980 | 17,506 | 10,170 | 8,597 | 1,573 | 6,980 | 544 | 6,909 | 4,300 | 39.5% | 62.2% | 44.6% |
| 1985 | 15,726 | 10,581 | 8,971 | 1,609 | 7,146 | 781 | 5,067 | 1,830 | 32.2% | 36.1% | 36.1% |
| 1990 | 16,988 | 8,914 | 7,355 | 1,559 | 5,582 | 857 | 8,018 | 4,296 | 47.2% | 53.6% | 52.2% |
| 1995 | 17,725 | 8,322 | 6,560 | 1,762 | 5,076 | 949 | 8,835 | 4,002 | 49.8% | 45.3% | 57.4% |
| 1996 | 18,309 | 8,295 | 6,465 | 1,830 | 5,072 | 981 | 9,478 | 4,211 | 51.8% | 44.4% | 59.4% |
| 1997 | 18,620 | 8,269 | 6,452 | 1,817 | 5,156 | 1,003 | 10,162 | 4,569 | 54.6% | 45.0% | 61.2% |
| 1998 | 18,917 | 8,011 | 6,252 | 1,759 | 5,077 | 945 | 10,708 | 4,905 | 56.6% | 45.8% | 63.1% |
| 1999 | 19,519 | 7,731 | 5,881 | 1,850 | 4,832 | 940 | 10,852 | 4,953 | 55.6% | 45.6% | 64.9% |
| 2000 | 19,701 | 7,733 | 5,822 | 1,911 | 4,851 | 1,040 | 11,459 | 5,203 | 58.2% | 45.4% | 66.3% |
| 2001 | 19,649 | 7,670 | 5,801 | 1,868 | 4,839 | 971 | 11,871 | 5,528 | 60.4% | 46.6% | 67.2% |
| 2002 | 19,761 | 7,626 | 5,746 | 1,880 | 4,761 | 984 | 11,530 | 4,605 | 58.3% | 39.9% | 66.7% |
| 2003 | 20,034 | 7,400 | 5,681 | 1,719 | 4,706 | 1,027 | 12,264 | 5,162 | 61.2% | 42.1% | 68.3% |
| 2004 | 20,731 | 7,228 | 5,419 | 1,809 | 4,510 | 1,048 | 13,145 | 5,701 | 63.4% | 43.4% | 70.8% |
| 2005 | 20,802 | 6,895 | 5,178 | 1,717 | 4,314 | 1,165 | 13,714 | 5,587 | 65.9% | 40.7% | 72.6% |
| 2006 | 20,687 | 6,841 | 5,102 | 1,739 | 4,361 | 1,317 | 13,707 | 5,517 | 66.3% | 40.2% | 72.9% |
| 2007 | 20,680 | 6,847 | 5,064 | 1,783 | 4,342 | 1,433 | 13,468 | 5,980 | 65.1% | 44.4% | 72.7% |
| **2008[p]** | **19,419** | **6,737** | **4,955** | **1,781** | **4,273** | **1,831** | **12,872** | **5,958** | **66.3%** | **46.3%** | **72.2%** |

**a** Includes crude oil, natural gas plant liquids and a small amount of other hydrocarbons and alcohol.

**b** Natural gas liquids recovered from natural gas in gas processing plants and, in some situations, from natural gas field facilities.

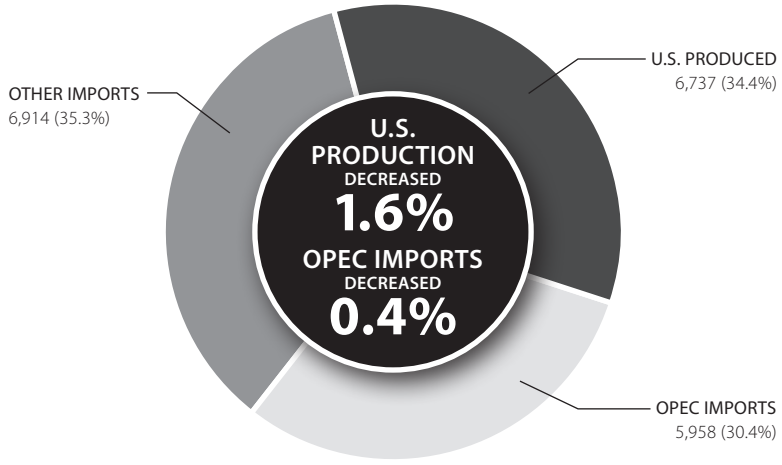
**c** Includes crude oil imports for the Strategic Petroleum Reserve (SPR).

**p** Preliminary

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* Tables 3.1, 3.3a and 3.3b [DOE/EIA- 0035(2009/05)] (May 2009) http://www.eia.doe.gov/emeu/mer Annual data: http://www.eia.doe/gov/emeu/aer

# 2008 U.S. Petroleum Use Domestically Produced and Imported

**2008** THOUSANDS OF BARRELS PER DAY

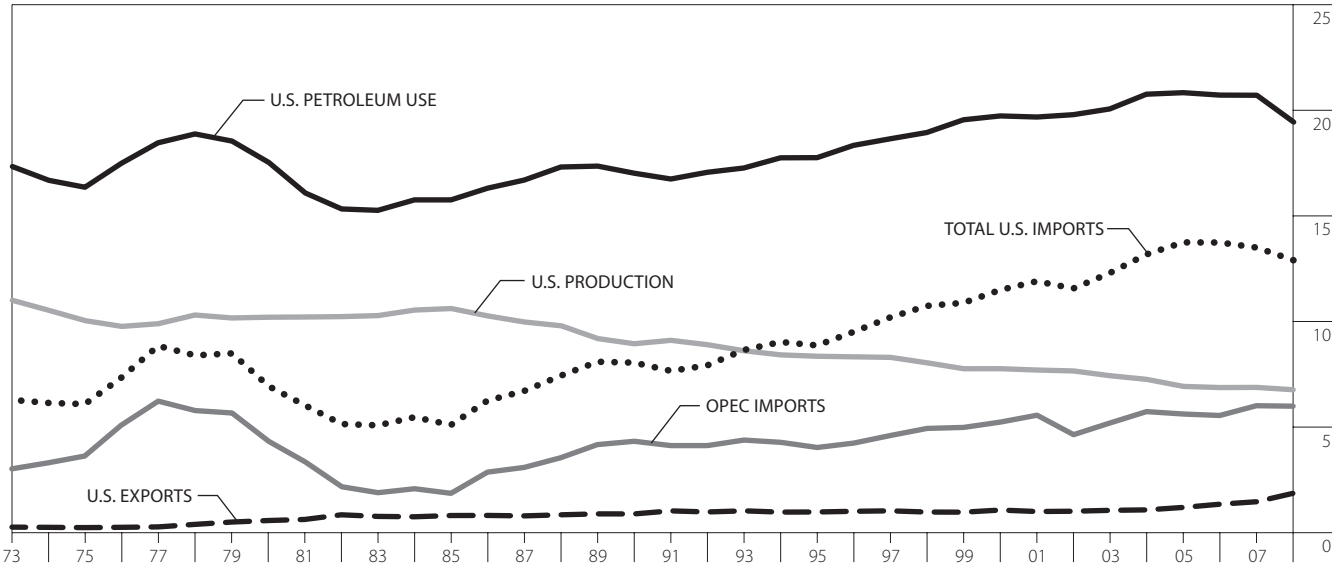



In 2008, U.S. production decreased 1.6 percent.

OPEC imports decreased .4 percent.

# U.S. Petroleum Use, Production, Imports and Exports

**1973-2008** MILLIONS OF BARRELS PER DAY



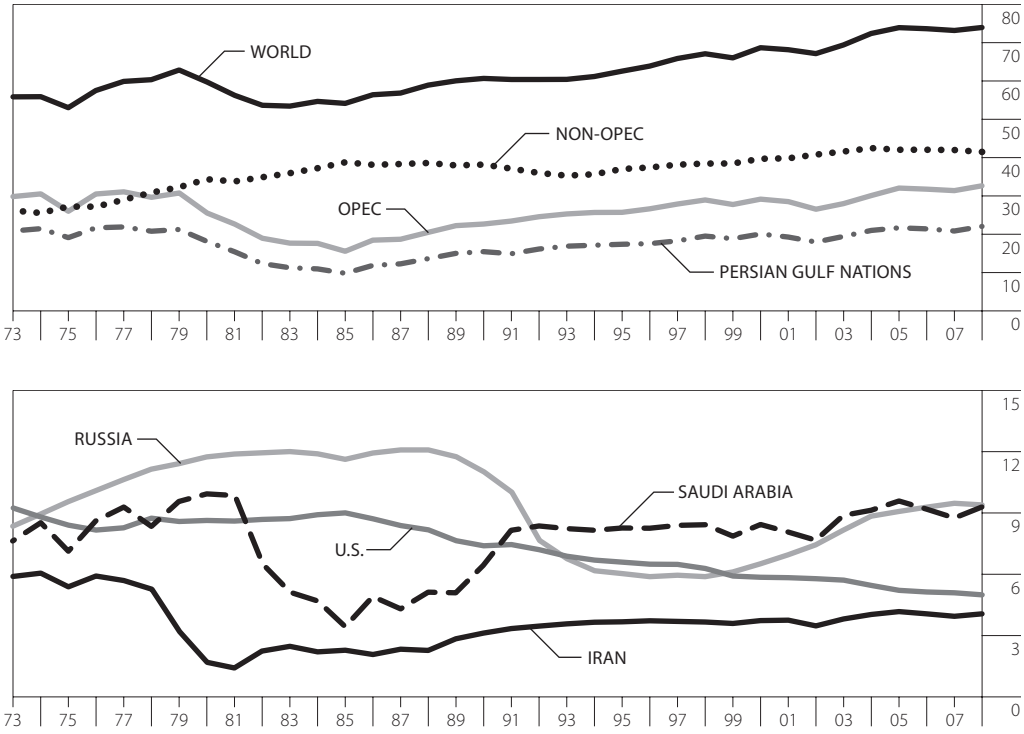

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035(2008/03)] (March 2008).

# World Crude Oil Production

**WORLD CRUDE OIL 1.1%**

In 2008, world production of crude oil was 73.78 million barrels per day, an increase of 1.1 percent from a year ago[d]. The Organization of Petroleum Exporting Countries (OPEC) produced 44.0 percent of the world's crude oil in 2008. The top four producers of crude oil in 2008 were Russia (12.7 percent), Saudi Arabia (12.6 percent), the U.S. (6.7 percent) and Iran (5.5 percent).

**1973-2008** MILLION BARRELS PER DAY




| Year | World | Non-OPEC | OPEC[b] | Persian Gulf Nations[c] | Major Crude Oil Producers | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | U.S. | Saudi Arabia | Iran | Russia[a] |
| 1973 | 55.68 | 26.02 | 29.66 | 20.67 | 9.21 | 7.60 | 5.86 | 8.32 |
| 1975 | 52.83 | 27.04 | 25.79 | 18.93 | 8.37 | 7.08 | 5.35 | 9.52 |
| 1980 | 59.56 | 34.18 | 25.38 | 17.96 | 8.60 | 9.90 | 1.66 | 11.71 |
| 1985 | 53.97 | 38.60 | 15.37 | 9.63 | 8.97 | 3.39 | 2.25 | 11.59 |
| 1990 | 60.49 | 38.00 | 22.49 | 15.28 | 7.36 | 6.41 | 3.09 | 10.98 |
| 1995 | 62.39 | 36.85 | 25.54 | 17.21 | 6.56 | 8.23 | 3.64 | 6.00 |
| 2000 | 68.50 | 39.52 | 28.98 | 19.89 | 5.82 | 8.40 | 3.70 | 6.48 |
| 2005[r] | 73.74 | 41.87 | 31.87 | 21.50 | 5.18 | 9.55 | 4.14 | 9.04 |
| 2006[r] | 73.46 | 41.87 | 31.59 | 21.23 | 5.10 | 9.15 | 4.03 | 9.25 |
| 2007[r] | 73.00 | 41.80 | 31.21 | 20.67 | 5.06 | 8.72 | 3.91 | 9.44 |
| **2008[p]** | **73.78** | **41.31** | **32.47** | **21.87** | **4.96** | **9.26** | **4.03** | **9.36** |

**a** Prior to 1992, production was for the former U.S.S.R.

**b** The OPEC countries include the Persian Gulf nations (with the exception of Bahrain) and Algeria, Indonesia, Libya, Nigeria and Venezuela. Ecuador rejoined OPEC in 2007 while Indonesia left OPEC at the end of 2008.

**c** The Persian Gulf nations are Bahrain, Iran, Iraq, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates, and the Neutral Zone.

**d** This figure does not include oil sands or other unconventional oil sources.

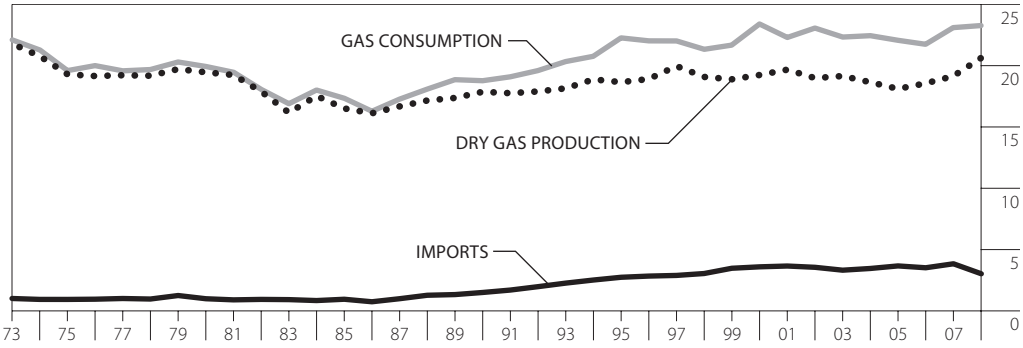
**r** Revised.

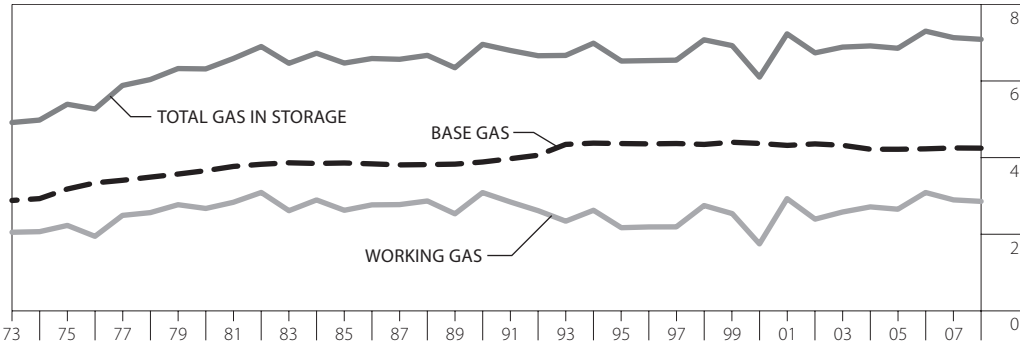
**p** Preliminary

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* Tables 11.1a and 11.1b [DOE/EIA-0035 (2009/05)] (May 2009). http://www.eia.doe.gov/emeu/mer/inter.html Annual data: http://www.eia.doe.gov/emeu/aer

# United States Natural Gas Production, Imports, Consumption and Storage

**1973-2008** TRILLIONS OF CUBIC FEET




| Year | U.S. Dry Natural Gas Production[a] | Net Imports | Consumption | Natural Gas in Underground Storage – Year End | | |
|---|---|---|---|---|---|---|
| | | | | Base Gas[b] | Working Gas[c] | Total |
| 1973 | 21.731 | 0.956 | 22.049 | 2.864 | 2.034 | 4.898 |
| 1975 | 19.236 | 0.880 | 19.538 | 3.162 | 2.212 | 5.374 |
| 1980 | 19.403 | 0.936 | 19.877 | 3.642 | 2.655 | 6.297 |
| 1985 | 16.454 | 0.894 | 17.281 | 3.842 | 2.607 | 6.449 |
| 1990 | 17.810 | 1.447 | 19.174 | 3.868 | 3.068 | 6.936 |
| 1995 | 18.599 | 2.687 | 22.207 | 4.349 | 2.153 | 6.502 |
| 2000 | 19.182 | 3.538 | 23.333 | 4.352 | 1.719 | 6.071 |
| 2005[r] | 18.051 | 3.612 | 22.011 | 4.200 | 2.635 | 6.835 |
| 2006[r] | 18.504 | 3.462 | 21.685 | 4.211 | 3.070 | 7.281 |
| 2007[r] | 19.089 | 3.785 | 23.047 | 4.234 | 2.879 | 7.113 |
| **2008[p]** | **20.561** | **2.975** | **23.215** | **4.229** | **2.840** | **7.069** |

**a** Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

**b** Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

**c** Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

**p** Preliminary.

**r** Revised.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* Tables 4.1 and 4.4. [DOE/EIA-0035 (2009/03)] (May 2009). http://www.eia.doe.gov/emeu/mer Annual data: http://www.eia.doe/gov/emeu/aer

CONSUMPTION
**0.7%**
PRODUCTION
**7.7%**

In 2008, U.S. natural gas consumption increased 0.7 percent. Domestic natural gas production increased 7.7 percent,

NET IMPORTS
**21.4%**
GAS IN STORAGE
**1.4%**

Net imports, primarily from Canada, decreased 21.4 percent. Working gas[c] in storage decreased 1.4 percent. This reflects a change from 2006, where consumption and net imports decreased and gas in storage increased.

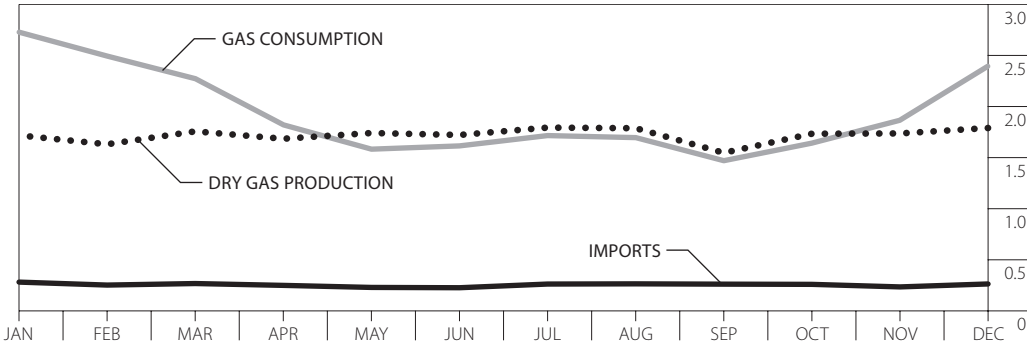
# United States Monthly Natural Gas Production, Imports, Consumption and Storage

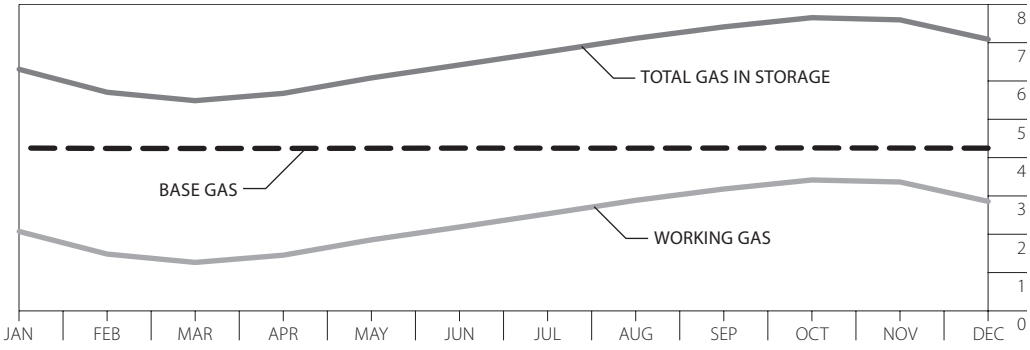
**100**
**CUBIC FEET OF NATURAL GAS = 1 THERM**

**1 THERM = 100,000 BRITISH THERMAL UNITS (BTU)**

Domestic natural gas production and imports remain relatively constant throughout the year. However, consumption increases significantly during the winter heating months. To provide sufficient natural gas for the winter heating months, the working gas in storage is withdrawn during these months, while natural gas is injected into storage during the non-heating months. Therefore, natural gas in storage generally peaks in October or November and is at a minimum in March.

**2008** TRILLIONS OF CUBIC FEET




| 2008 | U.S. Dry Natural Gas Production[a] | Net Imports | Consumption | | Natural Gas in Underground Storage – Month End | | |
|---|---|---|---|---|---|---|---|
| | | | | | Base Gas[b] | Working Gas[c] | Total |
| January | 1.711 | 0.275 | 2.721 | | 4.232 | 2.055 | 6.287 |
| February | 1.624 | 0.246 | 2.487 | | 4.222 | 1.465 | 5.687 |
| March | 1.750 | 0.261 | 2.266 | | 4.221 | 1.247 | 5.468 |
| April | 1.678 | 0.243 | 1.814 | | 4.223 | 1.436 | 5.659 |
| May | 1.734 | 0.223 | 1.576 | | 4.226 | 1.836 | 6.062 |
| June | 1.715 | 0.220 | 1.608 | | 4.230 | 2.171 | 6.401 |
| July | 1.787 | 0.256 | 1.709 | | 4.228 | 2.516 | 6.744 |
| August | 1.781 | 0.258 | 1.689 | | 4.228 | 2.867 | 7.095 |
| September | 1.540 | 0.255 | 1.463 | | 4.231 | 3.163 | 7.394 |
| October | 1.727 | 0.253 | 1.635 | | 4.235 | 3.399 | 7.634 |
| November | 1.730 | 0.228 | 1.859 | | 4.231 | 3.346 | 7.577 |
| December | 1.783 | 0.257 | 2.388 | | 4.229 | 2.840 | 7.069 |
| **Total** | **20.560** | **2.975** | **23.215** | **Average** | **4.228** | **2.362** | **6.590** |

**a** Dry Natural Gas Production is natural gas used to heat homes and buildings, and to power industry after the natural gas liquids, such as liquid propane, are removed.

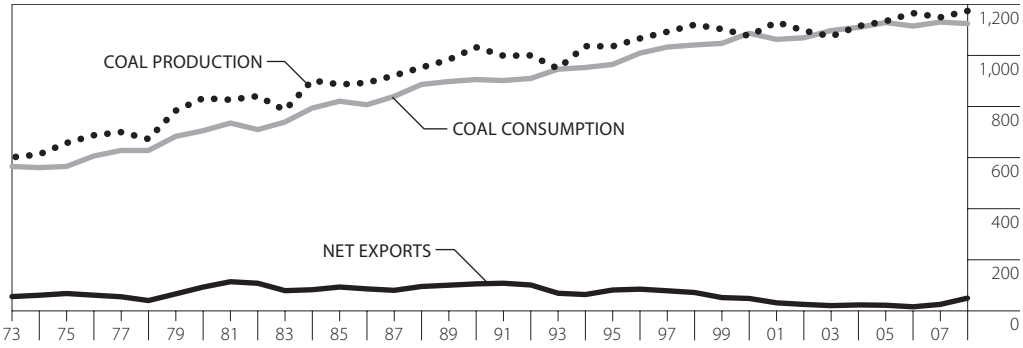
**b** Base Gas is the volume of gas needed as permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates during the withdrawal season.

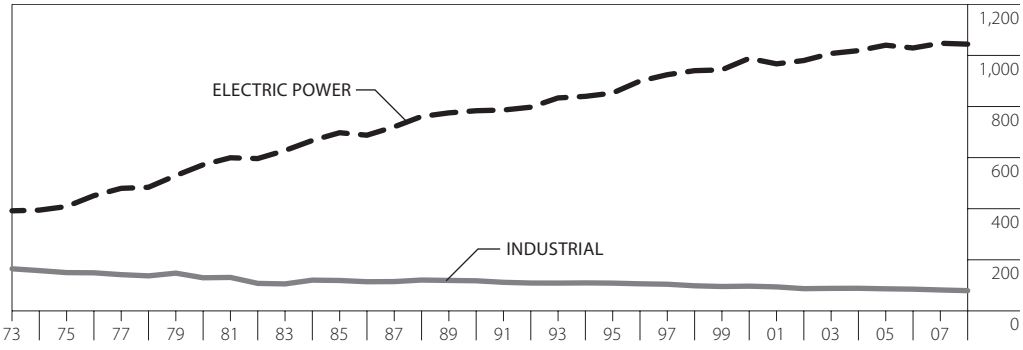
**c** Working Gas is the gas that can be withdrawn from storage to heat buildings and power industry.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 4.1 and 4.4 [DOE/EIA-0035 (2009/05)] (May 2009). www.eia.doe.gov/emeu/mer/

# United States Coal Production, Net Exports, Consumption and Sector Usage

**1973-2008** MILLIONS OF TONS




| Year | Coal Production | Net Exports | Consumption | Coal Use by Sector | | |
|---|---|---|---|---|---|---|
| | | | | Res. & Com.[a] | Industrial | Electric Power |
| 1973 | 598.6 | 53.5 | 562.6 | 11.1 | 162.1 | 389.2 |
| 1975 | 654.6 | 65.4 | 562.6 | 9.4 | 147.2 | 406.0 |
| 1980 | 829.7 | 90.5 | 702.7 | 6.5 | 127.0 | 569.3 |
| 1985 | 883.6 | 90.7 | 818.0 | 7.8 | 116.4 | 694.8 |
| 1990 | 1,029.1 | 103.1 | 902.9 | 6.7 | 115.2 | 781.0 |
| 1995 | 1,033.0 | 79.1 | 962.0 | 5.8 | 106.1 | 850.2 |
| 2000 | 1,073.6 | 46.0 | 1,084.1 | 4.1 | 94.1 | 985.8 |
| 2005[r] | 1,131.4 | 19.5 | 1,126.0 | 4.7 | 83.8 | 1,037.5 |
| 2006[r] | 1,162.8 | 13.4 | 1,112.3 | 3.2 | 82.4 | 1,026.6 |
| 2007[r] | 1,146.6 | 22.8 | 1,128.0 | 3.5 | 79.3 | 1,045.1 |
| **2008[p]** | **1,171.5** | **47.3** | **1,121.7** | **3.5** | **76.6** | **1,041.6** |

**a** Res. & Com. represents residential and commercial.

**p** Preliminary.

**r** Revised.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*, Tables 6.1 and 6.2, [DOE/EIA-0035 (2009/05)] (May 2009). http://www.eia.doe.gov/emeu/mer Annual data: http://www.eia.doe.gov/emeu/aer

**DOMESTIC PRODUCTION EXCEEDS DEMAND**

Unlike petroleum or natural gas, domestic production of coal exceeds demand, and the U.S. is a net exporter of coal.

**NEARLY 93% OF COAL GENERATES ELECTRIC POWER**

**IN WISCONSIN 89% OF ELECTRICAL POWER IS GENERATED WITH COAL**

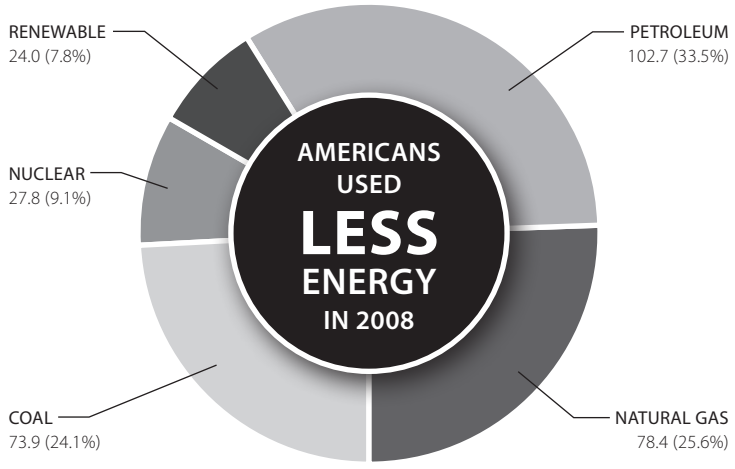
Nearly 93 percent of the coal used in the U.S. is for generating electric power, but 89 percent of Wisconsin's electricity is generated with coal. The Industrial sector uses about 7 percent, with the residential and commercial sectors combined using about 0.3 percent of total domestic consumption.

# United States Per Capita Resource Energy Consumption, by Type of Fuel[r]

U.S. PER CAPITA ENERGY CONSUMPTION **3.2%**

In 2008, U.S. per capita energy consumption decreased 3.2 percent.

**2008** MILLIONS OF BTU AND PERCENT OF TOTAL




**1970-2008** MILLIONS OF BTU AND PERCENT OF TOTAL

| Year | Petroleum[a] | | Natural Gas | | Coal | | Nuclear | | Renewables[b] | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1970[r] | 127.0 | *40.3%* | 106.0 | *33.7%* | 60.0 | *19.0%* | 1.0 | *0.3%* | 21.0 | *6.7%* | 315.0 |
| 1975[r] | 133.0 | *42.1%* | 93.0 | *29.4%* | 59.0 | *18.7%* | 9.0 | *2.8%* | 22.2 | *7.0%* | 316.2 |
| 1980 | 128.0 | *39.6%* | 90.0 | *27.8%* | 68.0 | *21.0%* | 12.0 | *3.7%* | 25.5 | *7.9%* | 323.5 |
| 1985 | 113.0 | *36.9%* | 75.0 | *24.5%* | 74.0 | *24.2%* | 17.0 | *5.6%* | 27.3 | *8.9%* | 306.3 |
| 1990 | 114.0 | *36.0%* | 77.0 | *24.3%* | 76.0 | *24.0%* | 25.0 | *7.9%* | 24.6 | *7.8%* | 316.6 |
| 1995 | 112.0 | *34.5%* | 85.6 | *26.4%* | 75.4 | *23.2%* | 26.6 | *8.2%* | 25.0 | *7.7%* | 324.6 |
| 1996 | 115.0 | *34.6%* | 86.1 | *25.9%* | 78.0 | *23.5%* | 26.3 | *7.9%* | 26.5 | *8.0%* | 331.9 |
| 1997 | 113.4 | *34.6%* | 85.6 | *26.1%* | 78.7 | *24.0%* | 24.2 | *7.4%* | 25.9 | *7.9%* | 327.8 |
| 1998 | 113.2 | *34.9%* | 83.1 | *25.6%* | 78.5 | *24.2%* | 25.6 | *7.9%* | 23.8 | *7.3%* | 324.3 |
| 1999 | 114.5 | *35.2%* | 82.5 | *25.3%* | 77.5 | *23.8%* | 27.3 | *8.4%* | 23.6 | *7.3%* | 325.4 |
| 2000 | 116.0 | *35.1%* | 84.4 | *25.5%* | 80.2 | *24.3%* | 27.9 | *8.4%* | 22.2 | *6.7%* | 330.8 |
| 2001 | 114.2 | *35.9%* | 79.8 | *25.1%* | 76.9 | *24.2%* | 28.2 | *8.9%* | 18.7 | *5.9%* | 317.8 |
| 2002 | 113.3 | *35.4%* | 81.8 | *25.6%* | 76.2 | *23.8%* | 28.3 | *8.8%* | 20.5 | *6.4%* | 320.0 |
| 2003 | 113.8 | *35.8%* | 78.7 | *24.8%* | 76.9 | *24.2%* | 27.4 | *8.6%* | 21.2 | *6.7%* | 318.0 |
| 2004 | 116.4 | *36.3%* | 78.1 | *24.3%* | 77.0 | *24.0%* | 28.0 | *8.7%* | 21.4 | *6.7%* | 320.8 |
| 2005 | 116.1 | *36.4%* | 76.2 | *23.9%* | 77.0 | *24.2%* | 27.5 | *8.6%* | 21.7 | *6.8%* | 318.5 |
| 2006 | 113.4 | *36.1%* | 74.5 | *23.7%* | 75.4 | *24.0%* | 27.5 | *8.8%* | 23.2 | *7.4%* | 314.0 |
| 2007[r] | 112.4 | *35.5%* | 78.4 | *24.7%* | 75.6 | *23.8%* | 28.1 | *8.9%* | 22.6 | *7.1%* | 317.1 |
| **2008[p]** | **102.7** | ***33.5%*** | **78.4** | ***25.6%*** | **73.9** | ***24.1%*** | **27.8** | ***9.1%*** | **24.0** | ***7.8%*** | **306.8** |

**a** To allow a more direct comparison with Wisconsin data, this figure excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

**b** Renewables includes biomass, hydro power, wood, solar, wind and geothermal.

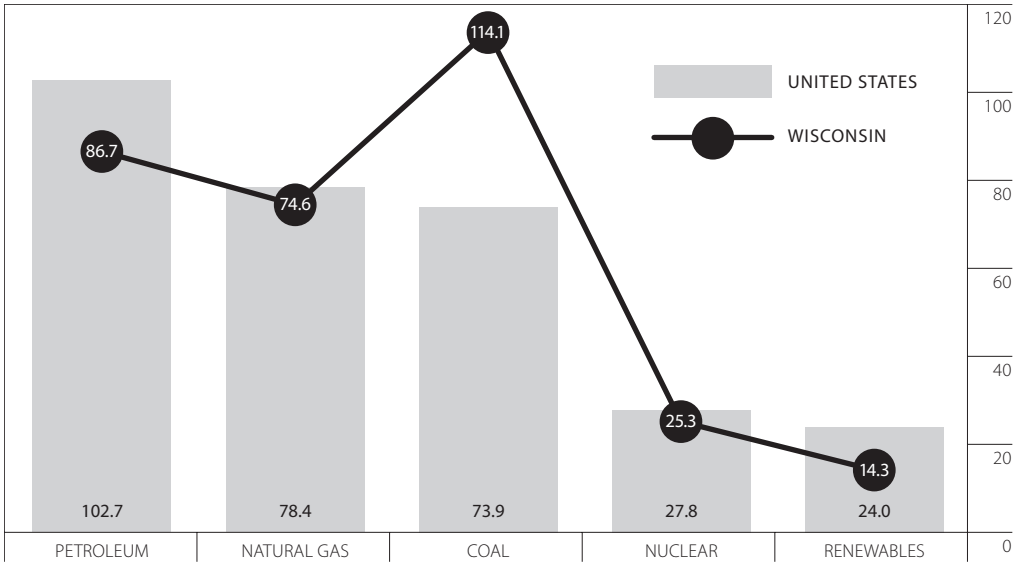
**r** Revised.

**p** Preliminary estimates.

**Source:** U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review* [DOE/EIA-0035 (2009/05] (March 2009), Table 1.3, http://www.eia.doe.gov/emeu/mer. State Energy Data Consumption (1997-2008), Table 7, http://www.eia.doe.gov/emeu/states/~seds.html

# Wisconsin Per Capita Resource Energy Consumption as Percent of United States, by Type of Fuel

## 2008 PER CAPITA RESOURCE ENERGY CONSUMPTION – MILLIONS OF BTU




IN 2008 **WISCONSIN** USED **102.7%** AS MUCH ENERGY **PER CAPITA** AS THE **NATIONAL AVERAGE**

In 2008, Wisconsin used 102.7 percent as much energy per capita as the national average. Wisconsin used significantly more coal than the national average because of the state's high use of electricity generated from coal. Wisconsin used less petroleum, natural gas, renewable and nuclear energy per capita than the national average.

## 1970-2008 WISCONSIN PER CAPITA RESOURCE ENERGY CONSUMPTION AS A PERCENT OF U.S.

| Year | Petroleum[a] | Natural Gas | Coal | Nuclear | Renewables[b] | Total[c] |
|---|---|---|---|---|---|---|
| 1970 | 82.0 | 70.0 | 123.4 | 33.0 | 29.5 | 82.2 |
| 1975 | 78.0 | 86.0 | 89.8 | 276.0 | 29.0 | 84.7 |
| 1980 | 75.0 | 82.0 | 99.4 | 189.0 | 40.7 | 83.6 |
| 1985 | 77.0 | 86.0 | 106.1 | 143.0 | 40.0 | 86.7 |
| 1990 | 80.0 | 81.0 | 135.7 | 100.0 | 41.6 | 92.1 |
| 1995 | 82.3 | 91.0 | 159.0 | 91.2 | 38.5 | 99.9 |
| 2000 | 80.7 | 90.4 | 149.6 | 86.5 | 46.1 | 98.2 |
| 2001 | 81.6 | 87.0 | 160.4 | 85.2 | 53.2 | 100.9 |
| 2002 | 83.2 | 89.8 | 152.0 | 90.9 | 51.0 | 100.0 |
| 2003 | 81.2 | 94.8 | 150.5 | 91.3 | 50.5 | 100.3 |
| 2004 | 81.3 | 91.8 | 152.5 | 86.1 | 51.8 | 99.6 |
| 2005 | 79.3 | 100.6 | 156.2 | 55.3 | 50.3 | 99.1 |
| 2006 | 80.2 | 92.4 | 144.0 | 88.4 | 48.6 | 96.9 |
| 2007 | 81.0 | 93.5 | 152.4 | 90.8 | 56.9 | 100.4 |
| **2008[p]** | **84.4** | **95.2** | **154.4** | **91.0** | **57.6** | **102.7** |

**a** This list excludes asphalt, road oil, lubricants, waxes, petroleum feedstocks and other petroleum products not used as energy sources.

**b** Renewables includes biomass, biogas, hydro power, wood, solar and wind.

**c** Total includes geothermal power, electricity produced from wood, and net imports of electricity.

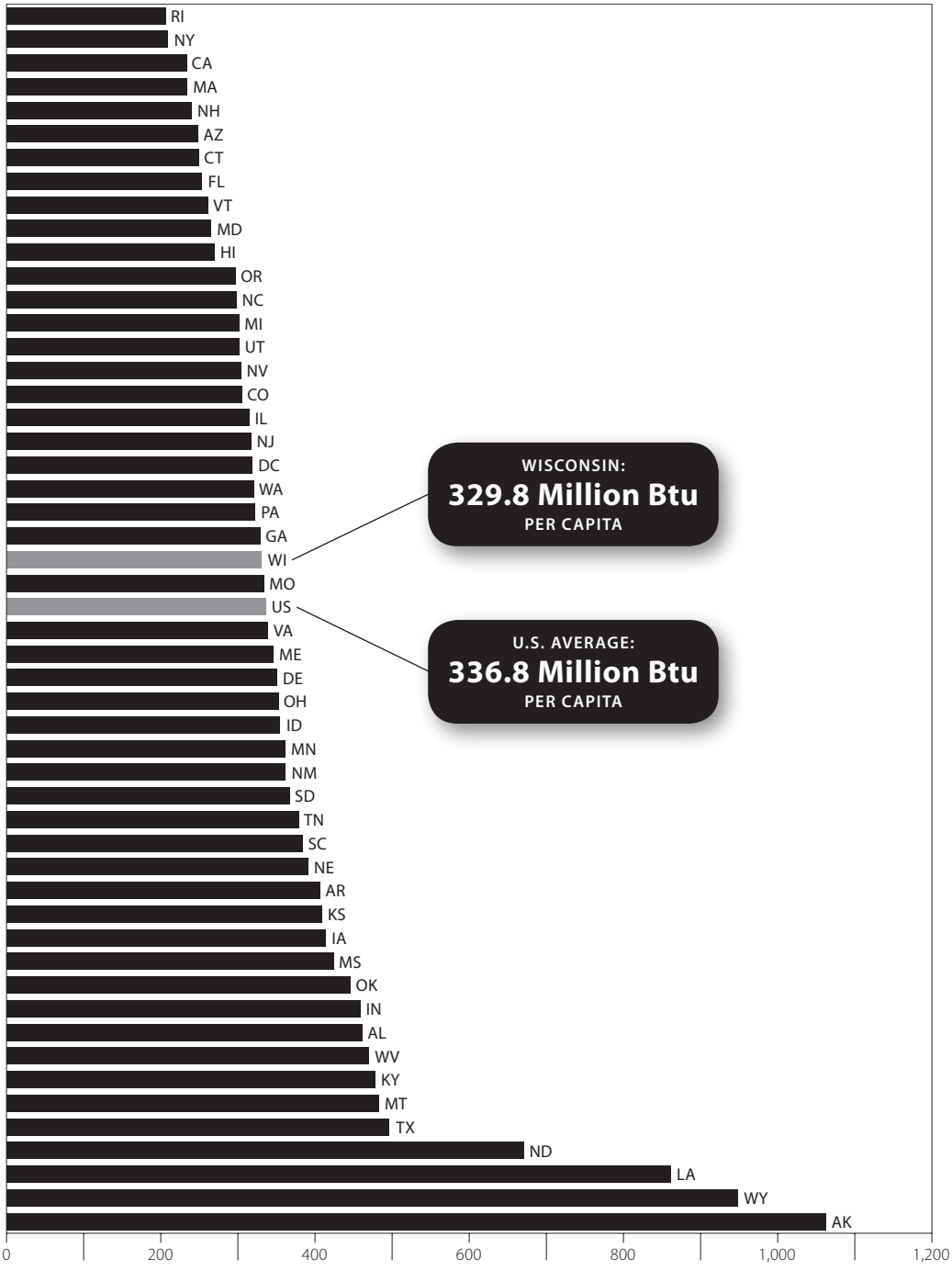
**p** Preliminary estimates.

**Source:** Compiled from tables in this publication for United States and Wisconsin per capita resource energy use.

# U.S. Per Capita Resource Energy Consumption, by State[a]

In 2007, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin is the 28th largest state user in the nation, including the District of Columbia, in per capita energy consumption.

**2007** MILLIONS OF BTU PER CAPITA

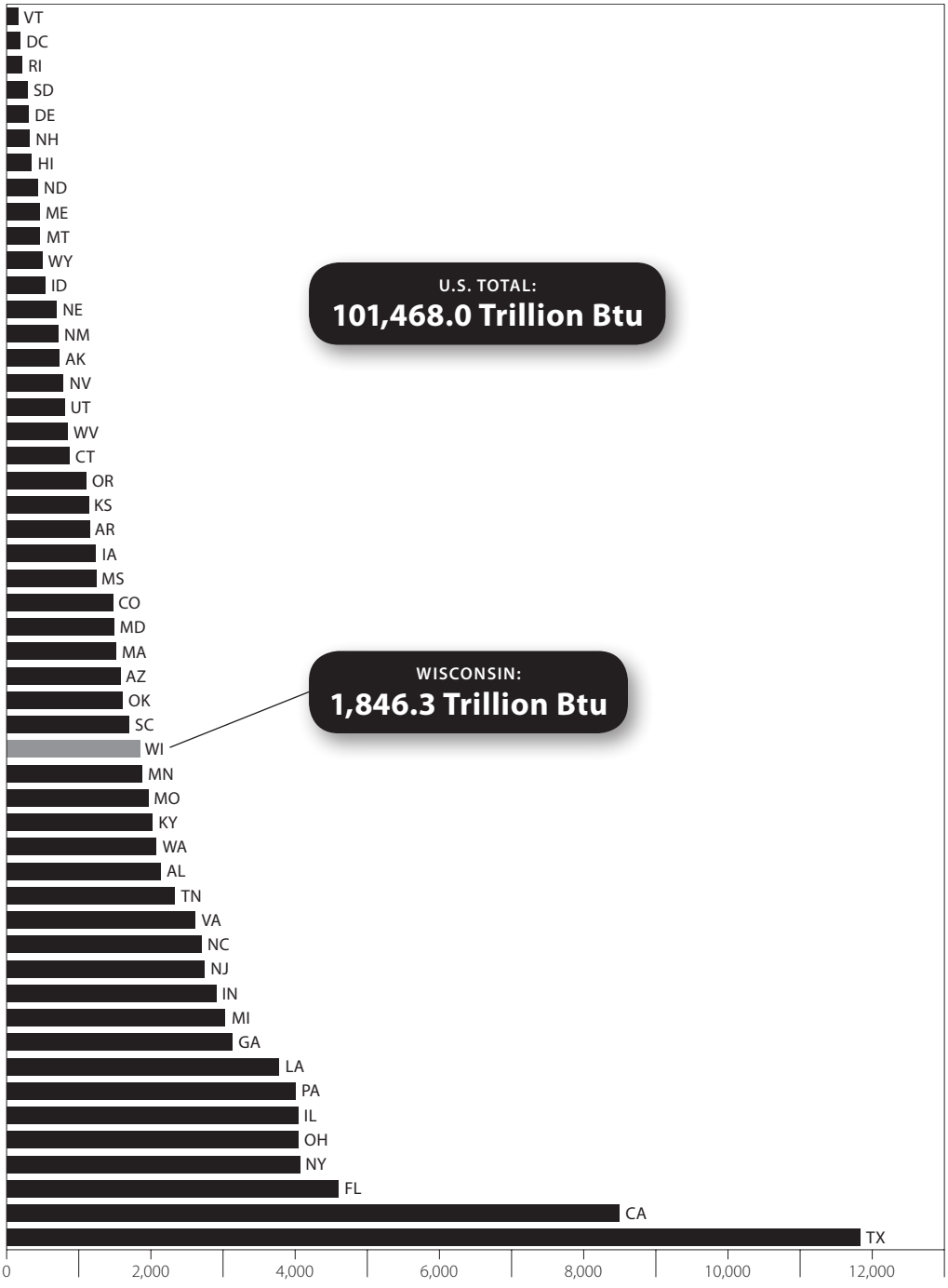



**a** Data reported in this table may differ from other tables because of different sources.

**Source:** U.S. Department of Energy, Energy Information Administration, *State Energy Data 2007: Consumption*, Table R2. http://www.eia.doe/gov/emeu/states/_seds.html

# U.S. Resource Energy Consumption, by State[a]

**2007** TRILLIONS OF BTU




In 2007, when non-energy uses of petroleum are included (such as road oil, asphalt and lubricants), Wisconsin used 1.8 percent of total energy consumed in the United States.

**a** Data reported in this table may differ from other tables because of different sources.

**Source:** U.S. Department of Energy, Energy Information Administration, *State Energy Data 2006: Consumption*, Table R1. http://www.eia.doe.gov/emeu/states/_seds.html